1. (amended) A power supply apparatus, comprising:

a DC-to-DC converter for converting a voltage of a power source supplied from a direct current power source to a first predetermined voltage, said first predetermined voltage being lower than said voltage of said source power; and

a voltage regulator for regulating said first predetermined voltage of said source power to at least a second predetermined voltage, said second predetermined voltage being lower than said first predetermined voltage.

2. (amended) The power supply apparatus of Claim 1, wherein said DC-to-DC converter is turned into a non-active state to stop said voltage conversion and passes said voltage of said power source when an operation mode is changed to a sleep mode.

3. (amended) The power supply apparatus of Claim 2, wherein said DC-to-DC converter comprising:

a switching circuit arranged and configured to perform a switching operation for switching said power source and to output a pulsating current voltage;

a smoothing circuit configured to smooth said pulsating current voltage output by said switching circuit and to output a smoothed voltage to said voltage regulator; and

a controller configured to detect said smoothed voltage output from said smoothing circuit and to control said switching circuit to change a performance of said switching operation in response to a detection result of said smoothed voltage so that said smoothed voltage output by said smoothing circuit is substantially equal to said first predetermined voltage,

wherein said controller is turned into a non-active state to cause said switching circuit to stop said switching operation so as to pass said voltage of said power source through said

switching circuit and to output said voltage of said power source to said smoothing circuit when said operation mode is changed to said sleep mode.

4. (amended) The power supply apparatus of Claim 1, wherein said DC-to-DC converter outputs said voltage of said power source without performing said voltage conversion when said operation mode is changed to said sleep mode.

5. (amended) The power supply apparatus of Claim 4, wherein said converter comprising:

a switching circuit for switching said power source and outputting a pulsating current voltage;

a smoothing circuit for smoothing said pulsating current voltage output from said switching circuit and to output a smoothed voltage to said voltage regulator; and

a controller configured to detect said smoothed voltage output from said smoothing circuit and to control said switching circuit to change said switching operation in response to a detection result of said smoothed voltage so that said smoothed voltage output from said smoothing circuit is substantially equal to said first predetermined voltage,

wherein said controller causes said switching circuit to stop said switching operation so as to pass said voltage of said power source through said switching circuit and to output said voltage of said power source to said smoothing circuit when said operation mode is changed to said sleep mode.

6. (amended) The power supply apparatus of Claim 5, wherein said controller connects a load to an output terminal of said smoothing circuit and controls a current flowing

said load so as to reduce said voltage output from said smoothing circuit to said first predetermined voltage when said voltage output from said smoothing circuit is lower than said first predetermined voltage and when said operation mode is changed to a normal operation mode.

7. (amended) The power supply apparatus of Claim 6, wherein said controller comprises:

a transistor which operates as said load;

a comparator for comparing said voltage output from said smoothing circuit with said first predetermined voltage when said operation mode is changed to said normal operation mode and outputs a first comparison result; and

a current control circuit configured to control said transistor to produce a current flowing therethrough in response to said first comparison result of said comparator when said operation mode is changed to said normal operation mode.

8. (amended) The power supply apparatus of Claim 7, wherein said current control circuit controls said transistor to increase said current at a first predetermined pace when said voltage output from said smoothing circuit is determined as greater than said first predetermined voltage based on said first comparison result performed by said comparator.

9. (amended) The power supply apparatus of Claim 7, wherein said current control circuit controls said transistor to continue to increase said current at said first predetermined pace for a first predetermined time period when said voltage output from said smoothing circuit is determined as substantially equal to said first predetermined voltage based on said first

comparison result performed by said comparator, and controls said transistor to produce a saturated current flowing therethrough for a second predetermined time period immediately after said first predetermined time period.

10. (amended) The power supply apparatus of Claim 9, wherein said current control circuit controls said transistor to decrease said current at a second predetermined pace for a third predetermined time period immediately after said second predetermined time period.

11. (amended) The power supply apparatus of Claim 5, wherein said controller detects a current output from said switching circuit and controls said switching circuit to vary said current in response to said detected current when said operation mode is changed to said sleep mode.

12. (amended) The power supply apparatus of Claim 11, wherein said controller controls said switching circuit to straight output said voltage of said power source to said smoothing circuit when said current detected is smaller than a predetermined value and to reduce said current output therefrom to a value smaller than said predetermined value in a predetermined manner when said current is greater than said predetermined value.

13. (amended) The power supply apparatus of Claim 5, wherein said controller performs a second comparison between a reference voltage dropping at a substantially constant pace and said voltage output from said smoothing circuit in response to said detected voltage and, according to a result of said second comparison, controls a duty cycle of said switching operation performed by said switching circuit during a time said voltage output from said

smoothing circuit is reduced to said first predetermined voltage, when said operation mode is changed to said normal operation mode.

14. (amended) The power supply apparatus of Claim 13, wherein said controller performs a third comparison between another predetermined reference voltage and said voltage output from said smoothing circuit in response to said detected voltage and, according to a result of said third comparison, controls a duty cycle of said switching operation performed by said switching circuit when said voltage output from said smoothing circuit is reduced to said first predetermined voltage.

15. (amended) A power supply apparatus, comprising:

converting means for performing a DC-to-DC conversion for converting a voltage of a power source supplied from a direct current power source to a first predetermined voltage, said first predetermined voltage being lower than said voltage of said power source; and

regulating means for carrying out a voltage regulation for regulating said first predetermined voltage of said power source to at least a second predetermined voltage, said second predetermined voltage being lower than said first predetermined voltage.

16. (amended) The power supply apparatus of Claim 15, wherein said converting means is turned into a non-active state to stop said voltage conversion and straight passes said voltage of said power source when an operation mode is changed to a sleep mode.

17. (amended) The power supply apparatus of Claim 16, wherein said DC-to-DC converter comprising:

switching means for switching said power source and outputting a pulsating current voltage;

smoothing means for smoothing said pulsating current voltage output by said switching means and to output a smoothed voltage to said regulating means; and

controlling means for detecting said smoothed voltage output from said smoothing means and to control said switching means to change a performance of said switching operation in response to a detection result of said smoothed voltage so that said smoothed voltage output by said smoothing means is substantially equal to said first predetermined voltage,

wherein said controlling means is turned into a non-active state to cause said switching means to stop said switching operation so as to pass said voltage of said power source through said switching means and to output said voltage of said power source to said smoothing means when said operation mode is changed to said sleep mode.

18. (amended) The power supply apparatus of Claim 15, wherein said converting means outputs said voltage of said power source without performing said voltage conversion when said operation mode is changed to said sleep mode.

19. (amended) The power supply apparatus of Claim 18, wherein said converting means comprising:

switching means for switching said power source and outputting a pulsating current voltage;

smoothing means for smoothing said pulsating current voltage output from said switching means and to output a smoothed voltage to said regulating means; and

controlling means for detecting said smoothed voltage output from said smoothing means and to control said switching means to change a performance of said switching operation in response to a detection result of said smoothed voltage so that said smoothed voltage output from said smoothing means is substantially equal to said first predetermined voltage,

wherein said controlling means causes said switching means to stop said switching operation so as to pass said voltage of said power source through said switching means and to output said voltage of said power source to said smoothing means when said operation mode is changed to said sleep mode.

20. (amended) The power supply apparatus of Claim 19, wherein said controlling means connects a load to an output terminal of said smoothing means and controls a current flowing through said load so as to reduce said voltage output from said smoothing means to said first predetermined voltage when said voltage output from said smoothing means is lower than said first predetermined voltage and when said operation mode is changed to a normal operation mode.

21. (amended) The power supply apparatus of Claim 20, wherein said controlling means comprising:

a transistor which operates as said load;

comparing means for performing a first comparison for comparing said voltage output from said smoothing means with said first predetermined voltage when said operation mode is changed to said normal operation mode and outputs a first comparison result; and

current controlling means controlling said transistor to produce a current flowing therethrough in response to said first comparison result of said comparing means when said operation mode is changed to said normal operation mode.

22. (amended) The power supply apparatus of Claim 21, wherein said current controlling means controls said transistor to increase said current at a first predetermined pace when said voltage output from said smoothing means is determined as greater than said first predetermined voltage based on said first comparison result performed by said comparing means.

23. (amended) The power supply apparatus of Claim 21, wherein said current controlling means controls said transistor to continue to increase said current at said first predetermined pace for a first predetermined time period when said voltage output from said smoothing means is determined as substantially equal to said first predetermined voltage based on said first comparison result performed by said comparing means, and controls said transistor to produce a saturated current flowing therethrough for a second predetermined time period immediately after said first predetermined time period.

24. (amended) The power supply apparatus of Claim 23, wherein said current controlling means controls said transistor to decrease said current at a second predetermined pace for a third predetermined time period immediately after said second predetermined time period.

25. (amended) The power supply apparatus of Claim 19, wherein said controlling means detects a current output from said switching means and controls said switching means to

vary said current in response to said detected current when said operation mode is changed to said sleep mode.

26. (amended) The power supply apparatus of Claim 25, wherein said controlling means controls said switching means to straight output said voltage of said power source to said smoothing means when said current detected is smaller than a predetermined value and to reduce said current output therefrom to a value smaller than said predetermined value in a predetermined manner when said current is greater than said predetermined value.

27. (amended) The power supply apparatus of Claim 19, wherein said controlling means performs a second comparison between a reference voltage dropping at a substantially constant pace and said voltage output from said smoothing means in response to said detected voltage and, according to a result of said second comparison, controls a duty cycle of said switching operation performed by said switching means during a time said voltage output from said smoothing means is reduced to said first predetermined voltage, when said operation mode is changed to said normal operation mode.

28. (amended) The power supply apparatus of Claim 27, wherein said controlling means performs a third comparison between another predetermined reference voltage and said voltage output from said smoothing means in response to said detected voltage and, according to a result of said third comparison, controls a duty cycle of said switching operation performed by said switching means when said voltage output from said smoothing means is reduced to said first predetermined voltage.

29. (amended) A method of power supply, comprising the steps of:

using a DC-to-DC converter to convert a voltage of a power source supplied from a direct current power source to a first predetermined voltage, said first predetermined voltage being lower than said voltage of said power source; and

regulating said first predetermined voltage of said power source to at least a second predetermined voltage, said second predetermined voltage being lower than said first predetermined voltage.

30. (amended) The method of Claim 29, wherein said performing step turns said DC-to-DC converter into a non-active state to stop said DC-to-DC conversion and passes said voltage of said power source straight through said DC-to-DC converter to said voltage regulator when an operation mode is changed to a sleep mode.

31. (amended) The method of Claim 30, wherein said performing step comprising the steps of:

executing a switching operation for switching said power source to output a pulsating current voltage;

smoothing said pulsating current voltage output by said switching circuit to output a smoothed voltage to said voltage regulator;

detecting said smoothed voltage output in said smoothing step;

changing a performance of said switching operation in response to a detection result of said smoothed voltage so that said smoothed voltage output in said smoothing step is substantially equal to said first predetermined voltage; and

stopping said switching operation when said operation mode is changed to said sleep mode so as to apply said voltage of said power source to said smoothing circuit.

32. (amended) The method of Claim 29, wherein said DC-to-DC converter outputs said voltage of said power source without performing said voltage conversion when said operation mode is changed to said sleep mode.

33. (amended) The method of Claim 32, wherein said performing step comprising the steps of:

executing a switching operation for switching said power source to output a pulsating current voltage;

smoothing said pulsating current voltage output in said switching step to output a smoothed voltage to said voltage regulator;

detecting said smoothed voltage output in said smoothing step;

changing a performance of said switching operation in response to a detection result of said smoothed voltage so that said smoothed voltage output in said smoothing step is substantially equal to said first predetermined voltage; and

stopping said switching operation when said operation mode is changed to said sleep mode so as to apply said voltage of said power source to said smoothing circuit.

34. (amended) The method of Claim 32, further comprising steps of:

providing a transistor as a load;

applying said voltage output in said smoothing step to said transistor so that a current flows through said transistor when said voltage output in said smoothing step is lower than said

first predetermined voltage and when said operation mode is changed to a normal operation mode; and

adjusting said current flowing said load so as to reduce said voltage output in said smoothing step to said first predetermined voltage.

35. (amended) The method of Claim 34, wherein said adjusting step comprising the steps of:

performing a first comparison for comparing said voltage output in said smoothing step with said first predetermined voltage when said operation mode is changed to said normal operation mode to output a first comparison result; and

causing said transistor to produce a current flowing therethrough in response to said first comparison result of said comparing step when said operation mode is changed to said normal operation mode.

36. (amended) The method of Claim 35, wherein said causing step causes said transistor to increase said current at a first predetermined pace when said voltage output in said smoothing step is determined as greater than said first predetermined voltage based on said first comparison result performed in said comparing step.

37. (amended) The method of Claim 35, wherein said causing step causes said transistor to continue to increase said current at said first predetermined pace for a first predetermined time period when said voltage output in said smoothing step is determined as substantially equal to said first predetermined voltage based on said first comparison result performed in said comparing step, and causes said transistor to produce a saturated current

flowing therethrough for a second predetermined time period immediately after said first predetermined time period.

38. (amended) The method of Claim 37, wherein said causing step causes said transistor to decrease said current at a second predetermined pace for a third predetermined time period immediately after said second predetermined time period.

39. (amended) The method of Claim 33, further comprising the steps of:

detecting a current output in said switching step when said operation mode is changed to said sleep mode; and

instructing said switching step to change said current in response to said detected current.

40. (amended) The method of Claim 39, wherein said instructing step instructs said switching step to straight output said voltage of said power source to said smoothing step when said current detected is smaller than a predetermined value and to reduce said current output in said switching step to a value smaller than said predetermined value in a predetermined manner when said current is greater than said predetermined value.

41. (amended) The method of Claim 33, further comprising the steps of:

performing a second comparison between a reference voltage dropping at a substantially constant pace and said voltage output in said smoothing step in response to said detected voltage during a time said voltage output in said smoothing step is reduced to said first predetermined voltage; and

determining a duty cycle of said switching operation performed in said switching step according to a result of said second comparison.

42. (amended) The method of Claim 41, further comprising the steps of:

performing a third comparison between another predetermined reference voltage and said voltage output in said smoothing circuit in response to said detected voltage; and

controlling said duty cycle of said switching operation performed in said switching step according to a result of said third comparison when said voltage output in said smoothing step is reduced to said first predetermined voltage.